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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,343	10/28/2003	William Freeman	15436.83.1	5606

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EXAMINER

BUEKER, RICHARD R

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/695,343

Applicant(s)

FREEMAN ET AL

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 9 and 19-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

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Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-22, drawn to an apparatus, classified in class 118, subclass 504.
- II. Claims 23-28, drawn to a method, classified in class 427, subclass 248.1.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus can be used for other processes such as etching instead of deposition.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

This application also contains claims directed to the following patentably distinct species of the claimed invention: (1) means for controlling through put by magnetic field (the embodiment of Figs. 2, 3A and 3B); and (2) means for controlling throughput by thermal expansion (the embodiment of Fig. 5).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-4, 10 and 11 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims

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readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Mr. Maschkoff on Sept. 14, 2005 a provisional election was made with traverse to prosecute the invention of Group I and species (1), claims 1-8 and 10-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9 and 19-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 3, 4, 10, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (4,704,306) taken in view of Tang (5,904,961) and Moslehi (6,132,805). Nakamura discloses (see fig. 2 and col. 4, lines 27-28) a mask for physical vapor deposition having a fixed mask portion having plurality of channels defined by a top layer and a bottom layer. Nakamura also teaches the use of a mounting hole as claimed in claim 10. Nakamura doesn't discuss means for controlling throughput of a vaporized target material through the channels. Both of Tang (see fig. 1) and Moslehi teach that it is desirable to control the flow of vapor to a masked substrate, by using a shutter. It would have been obvious to use a shutter of the type taught by Tang or Moslehi with the mask of Nakamura in order to accurately control the starting and stopping of vapor flow through the channels of Nakamura's mask. Also, Moslehi teaches (see col. 2, lines 48-53, and also col. 4, lines 26-29) the use of "a magnetic control mechanism configured to control throughput of a vaporized target material through the channels" as recited in claim 12, and it would have been obvious to use the magnetic control mechanisms described by Moslehi to control vapor flow in the sputter apparatus of Nakamura.

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Claims 1-4 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tizabi (5,186,975) (see fig. 1 and col. 2, lines 1-18), who discloses a mask for physical vapor deposition having a fixed mask portion having plurality of channels defined by a top layer and a bottom layer. Tizabi teaches (col. 3, lines 67-68) that the throughput of vaporized material through the channels can be controlled by a shutter. The mask is provided with calibration marks which are inherently calibration scales as claimed in claim 12.

Claims 12, 13, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tizabi (5,186,975) taken in view of Moslehi (6,132,805). Moslehi teaches (see col. 2, lines 48-53) the use of "a magnetic control mechanism configured to control throughput of a vaporized target material through the channels" as recited in claim 12, and it would have been obvious to use the magnetic control mechanism described by Moslehi to control vapor flow in the apparatus of Tizabi.

Claims 1, 3, 4, 10 and 12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Moslehi (6,132,805). Moslehi (see figs. 1-3 and 6-7) discloses a variable adaptive mask comprising a fixed portion having a plurality of channels, means for controlling vapor through put and means for mounting the mask in a fixed position relative to a target and a substrate.

Claim 2 and 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi (6,132,805) in view of Mauger (4,919,749) or Magdo (4,256,532). Moslehi (see paragraph bridging cols. 7 and 8) teaches that his mask can be used as a shadow mask, and in applications such as vapor deposition and ion beam processing. Mauger

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(see fig. 9) and Magdo (see fig. 1) teach that shadow masks can desirably be comprised of a top and bottom layer. It would have been obvious to form the shadow mask suggested by Moslehi in plural layers in the conventional manner as taught by Mauger and Magdo.

Claims 1,3, 10 and 12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Cathey (6,027,619) (see figs. 5-7, for example), who discloses a physical vapor deposition apparatus which includes a fixed mask portion 28 which acts as a mask to protect the substrate from macroparticles by shielding the substrate from the macroparticles. It includes means for controlling throughput in the form of wires 74 wrapped in a spiral configuration to form an electromagnet, and baffles 68 which prevent macroparticles from being deposited on the substrate. Cathey teaches (fig. 7) that the fixed mask portion can include a plurality of channels that extend through the fixed mask portion, with wires wrapped in a spiral configuration around each of the channels. Regarding claim 3, the cylindrical channels of Cathey have a circular profile. Regarding the mounting hole of claims 10 and 12, the use of bolt holes in the flanges 64 and 66 of Cathey for attachment is inherent or at least obvious.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cathy (6,027,619) in view of Welty (5,840,163) (see Fig. 1) who teaches that a channel of the type disclosed by Cathey can also be of a rectangular profile.

Claims 2, 5, 6 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cathy (6,027,619) taken in view of Sathrum (6,139,964), who

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illustrates (see fig. 2a) an example of how an electromagnet is conventionally comprised of layers of windings. And it would have been obvious to use such a layered winding (including a top and bottom layer) in the fixed mask portion of Cathey.

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cathy (6,027,619) taken in view of Sathrum (6,139,964) for the reasons stated above, and taken in further view of Sanders (5,282,944) (see col. 4, lines 18-23) who teaches that electromagnet coils of an arc coating apparatus can successfully be controlled by computer-controlled power supplies. For that reason it would have been obvious to control Cathey's electromagnets using a computer controlled power supply.

Claims 1-6, 8, 10, 12-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sathrum (6,139,964) taken in view of Cathey (6,027,619). Sathrum (see figs. 2, 2a, 3 and 3a, for example) discloses a physical vapor deposition apparatus which includes a fixed mask portion which acts as a mask to protect the substrate from macroparticles (see col. 13, lines 36-49) by shielding the substrate from the macroparticles. It includes means for controlling throughput in the form of electromagnet coil 51 wrapped in a spiral configuration to form an electromagnet, and baffles 81 which prevent macroparticles from being deposited on the substrate. While Sathrum illustrates one channel, Cathey teaches (fig.7) an analogous apparatus in which the fixed mask portion can include a plurality of channels that extend through the fixed mask portion, with wires wrapped in a spiral configuration around each of the channels. It would have been obvious to provide plural channels in Sathrum's apparatus because Cathey teaches that plural channels allows for physical vapor

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deposition on a wider area of a substrate. Regarding claim 8, Sathrum teaches that the baffle plates 81 are magnets which are inherently or at least obviously made of a ferromagnetic material.

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sathrum (6,139,964) taken in view of Cathy (6,027,619) for the reasons stated above, and taken in further view of Sanders (5,282,944) (see col. 4, lines 18-23) who teaches that electromagnet coils of an arc coating apparatus can successfully be controlled by computer-controlled power supplies. For that reason it would have been obvious to control Sathrum's electromagnets using a computer controlled power supply.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard Bueker
Primary Examiner
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